DOCUMENT RESUME

ED 435 712 TM 030 343

AUTHOR Rudner, Lawrence M.; Schafer, William D.
TITLE How To Write a Scholarly Research Report. ERIC/AE Digest.
INSTITUTION ERIC Clearinghouse on Assessment and Evaluation, Washington, DC.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO EDO-TM-99-08
PUB DATE 1999-11-00
NOTE 4p.
CONTRACT ED99CO0032
AVAILABLE FROM ERIC Clearinghouse on Assessment and Evaluation, 1129 Shriver, University of Maryland, College Park, MD 20742. Tel: 800-464-3742 (Toll Free).
PUB TYPE ERIC Publications (071) -- ERIC Digests in Full Text (073)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Research Methodology; *Research Reports; Scholarly Journals; *Technical Writing
IDENTIFIERS ERIC Digests

ABSTRACT

This digest discusses the common sections of a research report and highlights frequently made mistakes. At every stage of the research activities, the researchers should think about the eventual research report. The report should be planned to focus on a single important finding or a highly related group of findings. Suggestions are made for the format and content of the following sections: (1) title; (2) abstract; (3) introduction and literature review; (4) method; (5) results; (6) discussion; and (7) references. Advice is also given about publishing, from choosing the journal in which to publish to coping with rejection. (SLD)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 435 712

How to Write a Scholarly Research Report

Lawrence M. Rudner
William D. Schafer

TM030343

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ERIC Digest EDO-TM-99-08

November 1999

BEST COPY AVAILABLE

How to Write a Scholarly Research Report

Lawrence M. Rudner, ERIC & University of Maryland
William D. Schafer, University of Maryland

Researchers communicate their results and help accumulate knowledge through conference papers, reports, on-line journals and print journals. While there are many rewards for having research disseminated in a scholarly outlet, the preparation of a good research report is not a trivial task.

This article discusses the common sections of a research report along with frequently made mistakes. While the emphasis here is on reports prepared for scholarly, peer-reviewed publication, these points are applicable to other forms of research reports. Dissertations and theses, for example, provide more detail than scholarly publications yet they adhere to the same basic scientific writing principles. Since all scientific research involves observation, description and analysis, points made in this article are applicable to historical and descriptive, as well as to experimental research.

More detail can be found in the *Publication Manual of the American Psychological Association* (APA, 1994), proposed revisions to the manual (Wilkinson and Task Force on Statistical Inference, 1999), and many research methods textbooks (cf. Gay and Airasian, 1999). For general suggestions on publishing research, see Thompson (1995) and some of the articles and books also cited therein.

FIRST STEPS IN WRITING A RESEARCH REPORT

You should constantly think about writing your report at every stage of your research activities. The sections of the research report discussed next in this article come from the most-cited style source for educational and psychological literature - the *Publication Manual of the American Psychological Association* (APA, 1994). The *Publication Manual* provides detailed information about the entire process of publication -- from organizing, writing, keying, and submitting your manuscript, to seeing the accepted manuscript through production and publication. Of special interest in the fourth edition are the updated sections on reporting statistics, writing without bias, preparing manuscripts with a word processor for electronic production and publishing research in accordance with ethical principles of scientific publishing. You should have a copy.

Plan your report to focus on a single important finding or highly related group of findings. In the process of analyzing your data, you probably uncovered many relationships and gained numerous insights into the problem. Your journal article submission, however, should contain only one key point. The point should be so fundamental that you should be able express it in one sentence or, at most, in a paragraph. If you have several key points, consider writing multiple manuscripts.

When writing your manuscript, keep in mind that the purpose is to inform the readers of what you investigated, why and how you conducted your investigation, the results and your conclusions. As the investigator and writer, your job is simply to report, not to convince and usually not to advocate. You must provide enough detail so readers can reach their own conclusions about the quality of your research and the veracity of your conclusions.

SECTIONS OF YOUR REPORT

Title - It is important that the title be both brief and descriptive of your research. Search engines will use the title to help locate your article. Readers make quick decisions as to whether they are going to invest the time to read your article largely based on the title. Thus, the title should not contain jargon or vernacular. Rather, the title should be short (generally 15 words or less) and clearly indicate what the study is about. If in doubt, try to specify the cause and effect relationship in your key point. Avoid trite and wasteful phrases such as "A study of ..." or "An investigation to determine ..."

Abstract - The abstract serves two major purposes: it helps a person decide whether to read the paper, and it provides the reader with a framework for understanding the paper if they decide to read it. Thus, your abstract should describe the most important aspects of the study within the word-limit provided by the journal. As appropriate for your research, try to include a statement of the problem, the people you studied, the dependent and independent variables, the instruments, the design, major findings, and conclusions. If pressed for space, concentrate on the problem and, especially, your findings.

Introduction - You will usually start your report with a paragraph or two presenting the investigated problem, the importance of the study, and an overview of your research strategy. You do not need to label this section. Its position within the paper makes that obvious.

The introductory paragraphs are usually followed by a review of the literature. Show how your research builds on prior knowledge by presenting and evaluating what is already known about your research problem. Assume that the readers possess a broad knowledge of the field, but not the cited articles, books and papers. Discuss the findings of works that are pertinent to your specific issue. You usually will not need to elaborate on methods.

The goal of the introduction and literature review is to demonstrate "the logical continuity between previous and present work" (APA, 1994, p. 11). This does not mean you need to provide an exhaustive historical review. Analyze the relationships among the related studies instead of presenting a series of seemingly unrelated abstracts or annotations. The introduction should motivate the study. The reader should understand why the problem was researched and why the study represents a contribution to existing knowledge. Unless the study is an evaluation of a program, it is generally inappropriate to attempt to motivate the study based on its social importance.

Method - The method section includes separate descriptions of the sample, the materials, and the procedures. These are subtitled and may be augmented by further sections, if needed.

Describe your sample with sufficient detail so that it is clear what population(s) the sample represents. A discussion of how the sample was formed is needed for replicability and understanding your study. The APA Task Force on Statistical Inference points out "how a population is defined affects almost every conclusion about an article" (Wilkinson, et al., 1999). Convenience samples are not unusual in scientific inquiry; their use should not discourage you from seeking a publication outlet for your report.

A description of your instruments, including all surveys, tests, questionnaires, interview forms, and other tools used to provide data, should appear in the materials subsection. Evidence of reliability and validity should be presented. Since reliability is a property of scores from a specific use of a specific instrument for a specific population, you should provide reliability estimates based on your data.

The design of the study, whether it is a case study, a survey, a controlled experiment, a meta-analysis, or some other type of research, is conveyed through the procedures subsection. It is here that the activities of the researcher are described, such as what was

ERIC® ERIC Clearinghouse on Assessment and Evaluation, 1129 Shriver Laboratory,
University of Maryland, College Park, MD 20742 • 800 464-3742

said to the participants, how groups were formed, what control mechanisms were employed, etc. The description is sufficient if enough detail is present for the reader to replicate the essential elements of the study. It is important for the procedures to conform to ethical criteria for researchers (APA, 1992).

Results - Present a summary of what you found in the results section. Here you should describe the techniques that you used, each analysis and the results of each analysis.

Start with a description of any complications, such as protocol violations and missing data that may have occurred. Examine your data for anomalies, such as outliers, points of high influence, miscoded data, and illogical responses. Use your common sense to evaluate the quality of your data and make adjustments if need be. Describe the process that you used in order to assure your readers that your editing was appropriate and purified rather than skewed your results.

With today's availability of statistical packages, it is fairly easy to use very sophisticated techniques to analyze your data. Understand the techniques you are using and the statistics that you are reporting. Try to use the simplest, appropriate technique for which you can meet the underlying assumptions.

If you are going to use inferential statistics, you should determine the power a priori based on your anticipated distribution, design, and definition of practical significance. This information must stem from your related literature and not the data that you collected. If you fail to reach statistical significance, then this analysis can be used to show that the finding does not stem from low power.

Where appropriate, compute and report effect sizes or, at a minimum, be sure you provide enough information so effect sizes can be computed. Effect sizes provide a common metric for evaluating results across studies and aid in the design of future studies. They will be needed by anyone who attempts a quantitative synthesis of your study along with the others in your area of research.

For most research reports, the results should provide the summary details about what you found rather than an exhaustive listing of every possible analysis and every data point. Use carefully planned tables and graphs. While tables and graphs should be self-explanatory, do not include a table or graph unless it is discussed in the report. Limit them to those that help the reader understand your data as they relate to the investigated problem.

Discussion - At this point, you are the expert on your data set and an authority on the problem you addressed. In this section, discuss and interpret your data for the reader, tell the reader of the implications of your findings and make recommendations. Do not be afraid to state your opinions.

Many authors chose to begin the discussion section by highlighting key results. Return to the specific problem you investigated and tell the reader what you now think and why. Relate your findings to those of previous studies, by explaining relationships and supporting or disagreeing with what others have found. Describe your logic and draw your conclusions. Be careful, however, not to over generalize your results. Your conclusions should be warranted by your study and your data.

Be sure to recognize the limitations of your study. Try to anticipate the questions a reader will have and suggest what problems should be researched next in order to extend your findings into new areas.

References - There should be a one-to-one match between the references cited in the report and the references listed in the reference section.

PUBLISHING YOUR REPORT

In the process of reviewing the literature, you will have learned which journals publish articles on your topic. If you intend to publish in a journal, these journals will be the most likely candidates. Review the target audience and publication guidelines for these journals to decide which is best suited to your research. Regardless of scholarly quality, a key question in any editor's mind will be whether your manuscript is suited to the journal's purpose and audience. When considering where to submit, note the style of the articles in the journal. For example, if the journal typically publishes articles developing theories based on extensive reviews of the literature and your article is more empirical, then perhaps you should look elsewhere.

Remember that the review process is conducted by human staff, and so is a fallible process. Peters and Ceci (1982) made this point abundantly clear. They retyped just-published articles from prominent journals, and resubmitted them. All of these articles were rejected without it being noticed that they had just been published by same journals.

Because of high rejection rates and the usual long length of time journals need to make a selection decision, it is tempting to submit a manuscript simultaneously to more than one journal. This, however, is clearly unethical. Most journals appropriately specify that manuscripts under consideration cannot be submitted elsewhere. The editors and reviewers will be taking a considerable amount of time examining your manuscript, usually as volunteers.

You should expect your manuscript to be rejected when it is submitted for the first time. If a manuscript is rejected, you should evaluate the comments and then decide whether to revise, resubmit, or submit it elsewhere. In order to facilitate both your revision and its subsequent evaluation, a resubmission should be accompanied by a description of the issues raised in the review process and your manuscript modifications and other substantive reactions to them.

While very little has been written about ethical standards for authors in the education field, the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*, which have been adopted by more than 500 scientific and biomedical journals, address criteria for authorship, acknowledgments, redundant publication, competing manuscripts, and conflict of interest. A concise summary of the *Uniform Requirements* can be found in Syrett and Rudner (1996).

A key concept in the *Uniform Requirements* is that individuals identified as authors should have made significant contributions to the conception and design, or analysis and interpretation of data, or both; to drafting of the manuscript or revising it critically for intellectual content; and on final approval of the version of the manuscript to be considered for publication. Being an advisor or head of a research group, does not, in itself, warrant authorship credit.

ADDITIONAL READING

American Psychological Association (1992). Ethical principles of psychologists and code of conduct. *American Psychologist, 47*, 1597-1611.

American Psychological Association (1994). *Publication Manual of the American Psychological Association* (4th ed.). Washington, DC: Author.

Gay, L.R. & P.W. Airasian (1999). *Educational Research: Competencies for Analysis and Application*. 6th edition. New York: Prentice Hall.

Peters, D.C., & Ceci, S.J. (1982). Peer review practices of psychological journals: The fate of published articles, submitted again. *The Behavioral and Brain Sciences*, 5, 187-255.

Syrett, Kristen L. & Rudner, Lawrence M. (1996). Authorship Ethics. Practical Assessment, Research & Evaluation, 5(1).

Thompson, B. (1995). Publishing your research results: Some suggestions and counsel. *Journal of Counseling and Development*, 73, 342-345.

Wilkinson, L. and Task Force on Statistical Inference (1999). Statistical Methods in Psychology Journals: Guidelines and Explanations. *American Psychologist*, 54 (8), 594-604.

This publication was prepared with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under contract ED99CO0032. The opinions expressed in this report do not necessarily reflect the positions or policies of OERI or the U.S. Department of Education. ***Permission is granted to copy and distribute this ERIC/AE Digest.***